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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,065	09/26/2006	Ryouichi Takeuchi	Q80875	8882

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EXAMINER	
WEBB, VERNON P	

ART UNIT	PAPER NUMBER
2811	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/594,065	TAKEUCHI ET AL.	
	Examiner	Art Unit	
	VERNON P. WEBB	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 May 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) *9-11* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 September 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09/26/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Application

1. This office action is in response to the filing of the application papers on 15 May 2008, Claims 1-11 are pending in this application.

Election/Restrictions

2. Applicant's election without traverse of claims 1-8 in the reply filed on 05/15/2008 is acknowledged.

3. Claims 9-11are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claims. Election was made **without** traverse in the reply filed on 05/15/2008.

Foreign Priority

4. Acknowledgement is made that the certified copy of the foreign priority document has been received.

Information Disclosure Statement

5. Acknowledgement is made that the information disclosure statements filed on 09/26/2006 has been received and considered by the examiner. If the applicant is aware of any prior art or any other co-pending applications not already of record, he/she is reminded of his/her duty under 37 CFR 1.56 to disclose the same.

Specification

6. The disclosure is objected to because of the following informalities: The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. Appropriate correction is required. The following title is suggested: "Compound Semiconductor Light-Emitting Device with an AlGaInP Light-Emitting Layer Formed Within."

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 1-8 rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (U.S. Pub. Application 2003/0047737 A1) and further in view of Udagawa et al. (U.S. Pub. Application 2004/0169184 A1).

10. Regarding claim 1, Lin et al. discloses a pn-junction compound semiconductor light-emitting device comprising:

- a stacked structure (items 10,14,16,18, 20, 22, 28, 30-32, and 34) including a light-emitting layer (item 20) composed of an n-type or a p-type aluminum gallium indium phosphide and a light-permeable substrate (item 10) for supporting the stacked structure (items 10,14,16,18, 20, 22, 28, 30-32, and 34), the stacked structure and the light-permeable substrate being joined together, characterized in that the stacked structure includes an n-type or a p-type conductor layer (item 18), and that the conductor layer (item 18) and the substrate (item 10) are joined together (pg. 2, paragraphs [0021-0024] and [0031]; Figs. 1-3).

11. Lin et al. does not disclose a pn-junction compound semiconductor light-emitting device wherein the conductor layer is composed of a Group III-V compound semiconductor containing boron.

12. However Udagawa et al. discloses a pn-junction compound semiconductor light-emitting device wherein the conductor layer (item 106) is composed of a Group III-V compound semiconductor containing boron (pg. 5, paragraph [0052]; pg. 12, paragraph [0109]; Figs. 2-3).

13. It would have been obvious for one of ordinary skill in the art at the time of the invention to form a pn-junction compound semiconductor light-emitting device as disclosed by Lin et al. wherein the conductor layer is composed of a Group III-V compound semiconductor containing boron as disclosed by Udagawa et al.

thus providing a light-emitting device having excellent electrical and emission characteristics (pg. 3, paragraph [0015], lines 1-7).

14. Regarding claim 2, Lin et al. discloses a pn-junction compound semiconductor light-emitting device as described in regards to claim 1, wherein the conductor layer (item 18) has a bandgap at room temperature which is greater than that of the light-emitting layer (item 20) (pg. 3, paragraphs [0022-0023]; Figs. 1-3).

15. Regarding claim 3, Lin et al. discloses a pn-junction compound semiconductor light-emitting device as described in regards to claim 1.

16. Lin et al. does not disclose a pn-junction compound semiconductor light-emitting device wherein the conductor layer is composed of an undoped Group III-V compound semiconductor containing boron to which an impurity element has not been intentionally added.

17. However Udagawa et al. discloses a pn-junction compound semiconductor light-emitting device wherein the conductor layer (item 106) is composed of an undoped Group III-V compound semiconductor containing boron to which an impurity element has not been intentionally added (pg. 9, paragraph [0082], lines 1-5; pg. 12, paragraph [0107], lines 6-11; Figs. 2-3).

18. It would have been obvious for one of ordinary skill in the art at the time of the invention to form a pn-junction compound semiconductor light-emitting device as disclosed by Lin et al. wherein the conductor layer is composed of an undoped Group III-V compound semiconductor containing boron to which an impurity element has not been intentionally added as disclosed by Udagawa et

al. thus preventing propagation of dislocations from the light emitting layer to the upper layer (pg. 11, paragraph [0094]).

19. Regarding claim 4, Lin et al. discloses a pn-junction compound semiconductor light-emitting device as described in regards to claim 1.

20. Lin et al. does not disclose a pn-junction compound semiconductor light-emitting device, wherein the conductor layer is composed of a Group III-V compound semiconductor containing arsenic and boron.

21. However Udagawa et al. discloses a pn-junction compound semiconductor light-emitting device, wherein the conductor layer (item 106) is composed of a Group III-V compound semiconductor containing arsenic and boron (pg. 5, paragraph [0052], Figs. 2-3).

22. It would have been obvious for one of ordinary skill in the art at the time of the invention to form a pn-junction compound semiconductor light-emitting device as disclosed by Lin et al., wherein the conductor layer is composed of a Group III-V compound semiconductor containing arsenic and boron as disclosed by Udagawa et al. thus providing a semiconductor light-emitting device having high emission intensity and excellent reverse breakdown voltage (pg. 1, paragraph [0003], Lines 3-7).

23. Regarding claim 5, Lin et al. as modified by Udagawa et al. discloses a pn-junction compound semiconductor light-emitting device as described in reference to claim 1, wherein the conductor layer (item 106) is composed of a Group III-V compound semiconductor containing phosphorus and boron

(Udagawa, pg. 5, paragraph [0052]; pg. 12, paragraph [0109]; Figs. 2-3) (with the same motivation).

24. Regarding claim 6, Lin et al. as modified by Udagawa et al. discloses a pn-junction compound semiconductor light-emitting device as described in reference to claim 5, wherein the conductor layer (item 106) is composed of boron phosphide (Udagawa, pg. 5, paragraph [0052]; pg. 12, paragraph [0109]; Figs. 2-3) (with the same motivation).

25. Regarding claim 7, Lin et al. discloses a pn-junction compound semiconductor light-emitting device as described in regards to claim 1.

26. Lin et al. does not disclose a pn-junction compound semiconductor light-emitting device, wherein the conductor layer is composed of a boron-containing Group III-V compound semiconductor containing twins.

27. However Udagawa et al. discloses a pn-junction compound semiconductor light-emitting device, wherein the conductor layer (item 106) is composed of a boron-containing Group III-V compound semiconductor containing twins (pg. 12, paragraph [0111]; Figs. 2-3).

28. It would have been obvious for one of ordinary skill in the art at the time of the invention to form a pn-junction compound semiconductor light-emitting device as disclosed by Lin et al., wherein the conductor layer is composed of a boron-containing Group III-V compound semiconductor containing twins as disclosed by Udagawa et al. thus providing a device that has lower resistance and exhibits excellent efficiency of extraction of light (pg. 9, paragraph [0077], lines 4-7).

29. Regarding claim 8, Lin et al. as modified by Udagawa et al. discloses a pn-junction compound semiconductor light-emitting device as described in reference to claim 7, wherein each of the twins has, as a twinning plane, a (111) lattice plane of a boron-containing Group III-V compound semiconductor (Udagawa, pg. 12, paragraph [0111]; Figs. 2-3) (with the same motivation).

Cited Prior Art

30. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

i. Reference 1. U.S. Pat. 7,135,713 B2 (Chen)

Chen discloses a pn-junction compound semiconductor light-emitting device with a light-emitting layer composed of AlGaInP with a transparent substrate.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VERNON P. WEBB whose telephone number is (571)270-3332. The examiner can normally be reached on Monday through Friday, 7:30 am to 5 pm, Eastern.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne A. Gurley can be reached on 571-272-1760. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lynne A. Gurley/
Supervisory Patent Examiner, Art Unit 2811

/V. Parris Webb/
Examiner, Art Unit 2811